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NON-WIRES SOLUTIONS ROUND TABLE MEETING

Jan. 22, 2004

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Recap from previous day

Diane Adams

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Puget Sound Energy DSM Analysis (Kitsap Peninsula)

Bill Hopkins and Sue McLain

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Pilot Programs

Olympic Peninsula – Brad Miller

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TBL Demand Reduction Pilot
Olympic Peninsula

- Five Customers for 30+ MWs
- Pilot will run through March
- $10,000 Licensing Fees
- $15,000 Administrative Costs
- $/MW is negotiable

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DR Pilot Tests

Four Planned Events for each Facility

1. Fire Drill Test: Initial Offering will be for $0.00
2. Mid-week One-Hour offering for Full Reduction
3. Weekend Offering for One-Hour+ Monday Morning Reduction
4. Weather Dependent Full Offering

Offers to Generators will be coordinated with planned facility maintenance tests as much as possible

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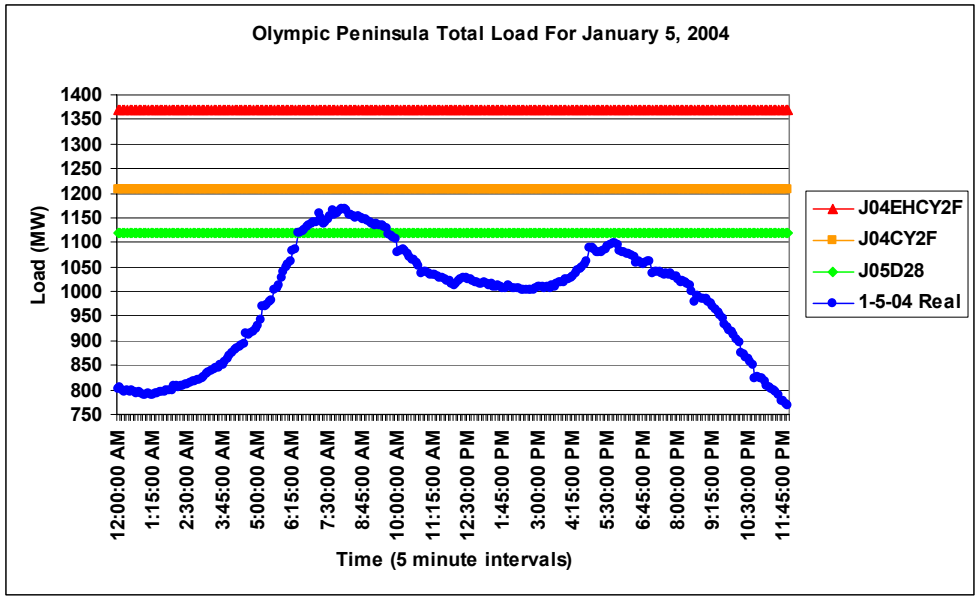
TBL Load Forecast for 2005



J04EHCY2F is the final basecase made in 2002 with forecasted system for 2004 for extreme winter (-15C on Peninsula).

J04CY2F is the final basecase made in 2002 with forecasted system for 2004 for normal winter (-5C on Peninsula).

J05D28 is a basecase which is still being worked on and **HAS NOT BEEN APPROVED** with forecasted system for 2005 for normal winter (-5C on Peninsula).

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Pilot Programs

Olympic Peninsula Celerity – Mike Hoffman

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CELERITY ENERGY
creating powerful solutions together

Upper Olympic Peninsula Non-Wires Solutions Project

- Celerity Energy is an Oregon corporation providing energy solutions from a variety of distributed energy resources that provide value to **both** energy suppliers and end-users.
- Celerity Energy seeks "best" technology applications to create aggregated networked resources.
- Create networks of demand response and distributed generation resources
- Create, manage and control networks of resources through an internet-based communications & applications platform

Current Projects

- The Beta Project
- Financed by Caterpillar Power Systems
- Power Marketing Agreement w/ PNM
- 25 MW project; Initial phase operational - 4 sites, 10 gen-sets – 4 gas, 5 diesel & 1 dual fuel

STATE OF CALIFORNIA
CONSUMER POWER AND CONSERVATION FINANCING AUTHORITY

- Aggregate 10 to 15 MW of load shedding capability
- Nominate loads for ISO markets
- Customers include hospitals and California State University System

- Dual Fuel Demonstration – operational 2 sites, 3 gen-sets
- Power Purchase Agreement (PPA)

Upper Peninsula Project

Highlights:

- Create an operable network of dispatchable DG resources
- Aggregate up to 5 MWs
- Primarily use customer-owned standby generation.
- Alternative fuels (bio-diesel, natural gas), Oxidation catalyst, and limited operating hours for environmental mitigation
- Focus on Clallam Co. PUD, Mason Co. PUD No. 3, City of Port Angeles service areas

Action Steps

- Meet with Bonneville regional Account Reps & Utilities
- Make contact with customers & determine environmental compliance
- Determine control and information as well as equipment upgrade needs
- Create cost estimates for each site - Rank Sites ($/kW environment options)
- Execute commercial arrangements with end-users
- Interconnection (physical and communications) of selected assets
- Manage installation and operation of assets - long term maintenance of assets

Pilot Programs

Idaho – Paul Kjellander

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Pilot Programs

Principles, Knowledge Needs, Selection Criteria, and Status – David Le

2005-2006 Pilots – Mike Weedall

Principles:

- Replicable and applicable pilot projects
- Willingness to contribute to project costs will drive the location of many projects
- Projects should be fundamentally oriented to prove reliability within the electric transmission context

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Technical Knowledge needs:

- Energy efficiency impact on peak use
- Cost and effectiveness of direct load control
- Lead and response times needed and available
- Environmental mitigation options, costs, and effects for distributed generation options.
- Reliability of NWS alternatives to traditional transmission solutions using BPA reliability standards.

Experiential:

- Strategic energy efficiency demonstrates both base and peak benefits.
- Implementation challenges of advanced commercial sector load dispatch aggregation.
- Demonstrate methods of aggregating various load control and load dispatch techniques and their effects on peak load at distribution and transmission system peaks.

Institutional:

- Clarify actual distribution level benefits of various direct load control strategies such as direct-load-control-only vs. direct-load-control as part of automated meter reading and other utility management strategies.
- Develop internal BPA processes that allow for rapid and effective implementation of Non-Wires Solutions

Pilot Selection Criteria:

- Contributes to a critical knowledge need or to a broad set of knowledge needs.
- Cost share contribution from project partners is available.
- Designed to be replicable, or directly applicable to a non-wires transmission opportunity.
- Relevant institutions involved.

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Pilots:

- Underway
  - Olympic Peninsula Demand Exchange
  - Celerity Distributed Generation Aggregation
  - Ashland Load Dispatch Aggregation
- 2004 Options
  - Solicitation for New Pilots issued during 2004 for 2005 & 2006
  - Study of bio-diesel fuel for back-up generation
  - Irrigation Load Management
  - Peak Shaving in Richland Public Buildings
  - Transactive Controls in Commercial Offices
  - Micro-Turbine at Pacific Northwest Laboratory

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Presentation from "Persistence of Measures" Subcommittee

Tom Foley

Presentation from "Price Signals" Subcommittee

Ken Corum

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Comparing Energy Transmission via Natural Gas Pipelines and Electric Wires Joint Study by Northwest Gas Association and BPA

Shep Buchanan

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Economics of Pipes and Wires

- Study looks at costs of energy delivery via natural gas pipelines versus electric transmission lines
- Jointly sponsored and conducted by BPA and Northwest Gas Association (NGA)
- *How do costs compare and do FERC pricing policies result in inefficient outcomes?*

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Figure 1

Illustration of Pipes vs. Wires Comparison

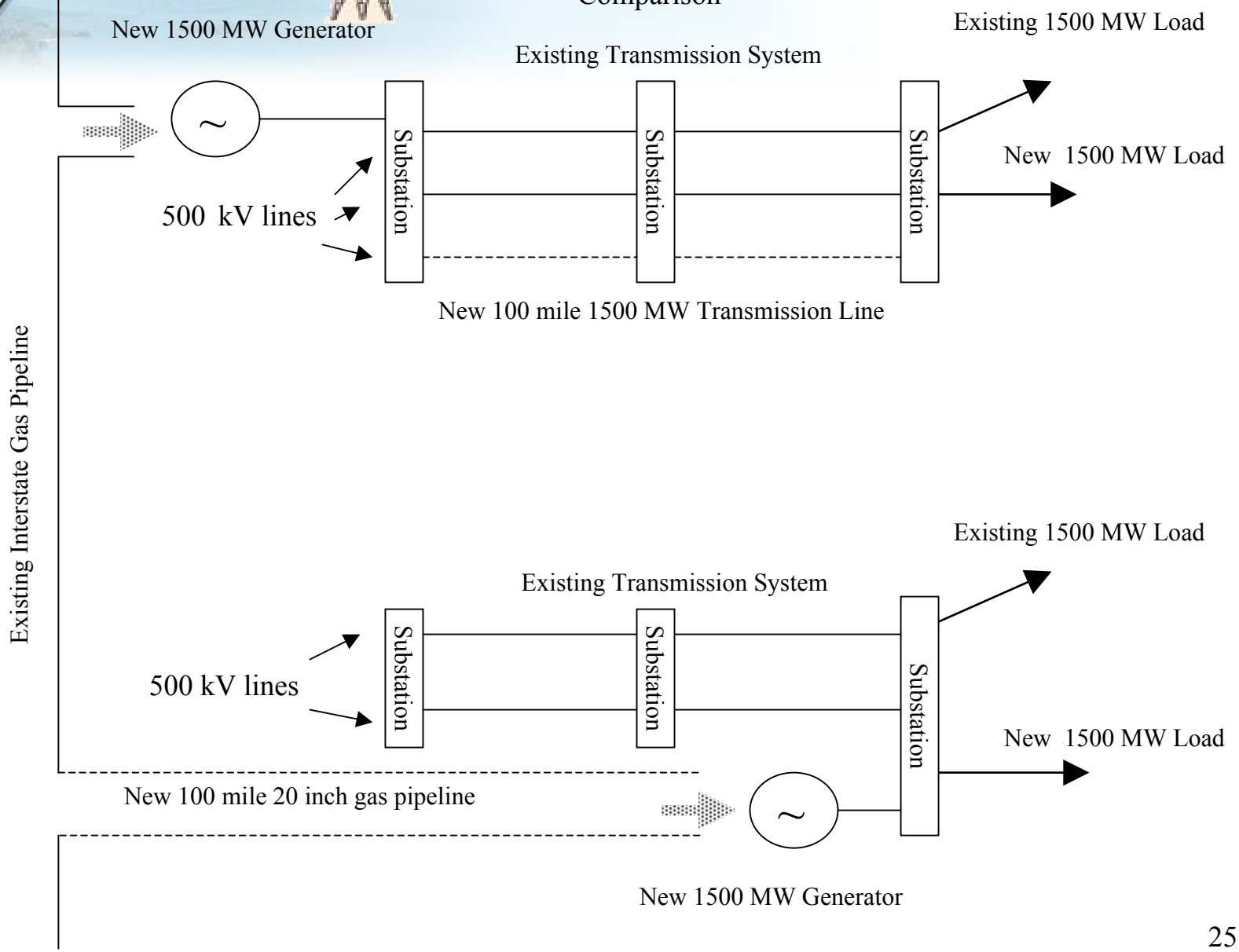

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Table 1 Cost Comparison

Transmission Costs				Pipeline Costs			
Capital cost per mile (new stations)	$1,865,500			Capital cost per mile (new stations)	$1,000,000		
Capital Cost for 100 miles (new stations)		$186,550,000		Capital Cost for 100 miles (new stations)		$100,000,000	
Operation and Maintenance Costs per year		$519,000		Operation and Maintenance Costs per year		$1,000,000	
Annual Payment, 30 years	1500 MW	*New Stations*		*Annual Payment, 30 years*	1500 MW	*New Stations*	
Miles	**7%**	12%		Miles	7%	**8.75%**	12%
100	**$15,033,393.57**	$23,158,999.32		100	$8,058,640.35	**$9,518,589.85**	$12,414,365.76
O & M Costs	**$519,000**	$519,000		*O & M Costs*	$1,000,000	**$1,000,000**	$1,000,000
Total Costs per year	**$15,552,394**	$23,677,999		*Total Costs per year*	$9,058,640	**$10,518,590**	$13,414,366
Cost Per kW-Yr	**$10.37**	**$15.79**		***Cost Per kW-Yr***	**$6.04**	**$7.01**	**$8.94**
BPA Transmission Rate	**$12.16**	$12.16		*BPA Transmission Rate*	$12.16	**$12.16**	$12.16
Cost per MWh (100% LF)	**$1.18**	$1.80		*Cost per MWh (100% LF)*	$0.69	**$0.80**	$1.02
Cost per MWh (65% LF)	**$1.82**	$2.77		*Cost per MWh (65% LF)*	$1.06	**$1.23**	$1.57

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Economics of Pipes and Wires

Conclusions

- **Pipes are cheaper than wires.** Site- and case-specific factors can change that.
- **FERC's pricing policies treat them consistently.** However, physical differences can make them appear different.
- **Merchant electrical transmission is unlikely to follow the gas pipeline model.** Participant funding will need greater certainty of economic gain.
- **The Region would benefit from integrated energy planning.** Infrastructure costs could be reduced.

Adjourn